

USER MANUAL

X5821

ADSL2+ router/modem

VERSION 1.0

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Chapter 1

Getting Started

I. Overview

The **X5821** is a multi-mode ADSL2+ router/modem, which is designed to interoperate with DSLAMs from major vendors to meet the worldwide ADSL CPE market requirements.

It complies with ANSI T1.413 issue 2, ITU-T G.dmt, G.lite, G.dmt.bis (ADSL2) and ADSL2+ with up to 24 Mbps downstream link rate. The integrated Ethernet switch features automatic crossover-correction and speed sensing for easily connecting to user's PCs or LAN environment.

II. Features

- Support up to ADSL2+ (G.992.5) with 24 Mbps downstream and 1 Mbps upstream rates
- Integrated one Ethernet port with automatic speed-sensing and crossover correction
- Support Networking protocols such as PPP, NAT, Routing, DHCP server/relay/client
- Configuration and management by Web-browser through the Ethernet interface and remotely through ADSL interface
- Firmware upgradeable through HTTP/TFTP

III. Packaging

This package consists of the following items:



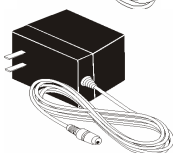
X5821 ADSL device unit



RJ-45 Cable



RJ-11 Cable



AC Adapter



User's Manual CD

IV. Safety Guidelines

In order to reduce the risk of fire, electric shock and injury, please adhere to the following safety guidelines.

- Carefully follow the instructions in this manual; also follow all instruction labels on this device.
- Except for the power adapter supplied, this device should not be connected to any other adapters.
- Do not spill liquid of any kind on this device.
- Do not place the unit on an unstable stand or table. This unit may drop and become damaged.
- Do not expose this unit to direct sunlight.
- Do not place any hot devices close to this unit, as they may degrade or cause damage to the unit.
- Do not place any heavy objects on top of this unit.
- Do not use liquid cleaners or aerosol cleaners. Use a soft dry cloth for cleaning.

V. Appearance

Front Panel



① ② ③ ④

	Label	Description
①	POWER	A steady red light means the power connection works properly.
②	LINK	Yellow, shows DSL line status.
③	DATA	Green, Flashing means the Modem is transmitting or receiving data.
④	PC	Green, Indicates status of connection to the PC network card.

Rear Panel

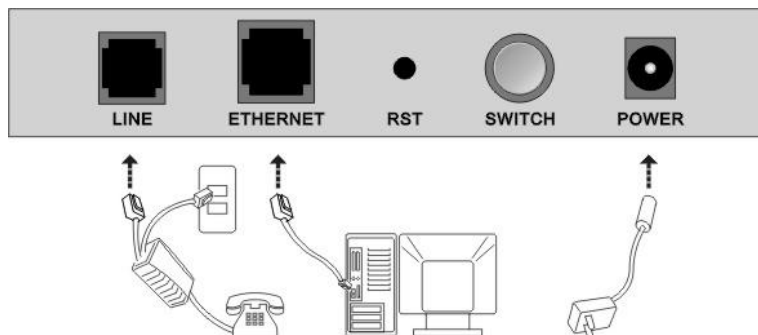


	Label	Description
①	LINE	Connected with phone line or "ADSL" port of the splitter.
②	ETHERNET	To be connected to a PC network card by a straight-through network cable, also can use a crossover cable to connect to Hub, Switch or Router.
③	RST	Reset to default settings is located at bottom of router. Press the reset button for 1 second while the router is up and running. Then you can reset the modem with the default settings.
④	SWITCH	To turn on / off the power.
⑤	POWER	Power interface, Connect with power adapter.

VI. Hardware Installation

Follow the steps below to set up your device:

- Step 1:** Connect one end of the ADSL cable to the LINE port of **X5821** and the other end to the ADSL wall outlet.
- Step 2:** Use a RJ-45 cable to connect one end to an ETHERNET port of **X5821** and the other end to the LAN or a PC with an Ethernet adapter installed.
- Step 3:** Plug in the AC adapter to the AC power socket, and then connect the DC jack to the POWER inlet of **X5821**. Push the SWITCH button to turn it on.



VII. Management

There are several ways that you can make the configuration:

- **Local Ethernet Port (telnet)** – connect the Ethernet port to your local area network or directly to a PC, “telnet” **X5821** from any workstation in the LAN. The default local Ethernet IP address is “192.168.1.1”. See Chapter 2, Command Line Interface, for more details.
- **Local Ethernet Port (Web browser)** – connect the Ethernet port to your local area network or directly to a PC. Launch your Web browser and enter default local Ethernet IP address “192.168.1.1” into the address bar.
- **ADSL Port from Remote Site** – while the ADSL connection is in service and it is set to router mode, you may remotely “telnet” **X5821** from a workstation connected to the equipment.

Note: As operating an ADSL device requires technical know-how and experience, it is recommended that only qualified technical staff manage **X5821**. Therefore, a password authentication is required when you enter the command line and Web interface. See the *Default Values* section to obtain the password.

VIII. Default Values

X5821 is pre-configured with the following parameters; you may also re-load the default parameters by pressing the reset button on the real panel or by using the **System Commands** link on the Web interface.

Username/Password: admin/admin

Default IP Address

Ethernet (local) IP: 192.168.1.1

Subnet mask: 255.255.255.0

Protocol

RFC1483 Bridge: VPI/VCI: NA/NA

Class (QoS): NA

WAN and ADSL

Local Line Code: Multi Mode

DHCP Server: Disable

DHCP start IP: 192.168.1.2

DHCP end IP: 192.168.1.254

Note: The Username and Password are case-sensitive.

IX. Software Upgrade

You may easily upgrade **X5821** embedded software by obtaining the compressed upgrade kit from the service provider and then following the steps for upgrading through a Web-browser:

- Step 1: Extract the ZIP file for updated firmware.
- Step 2: Connect **X5821** via the local Ethernet port or remote ADSL link, making sure that the **X5821** Ethernet IP address and your terminal are properly configured so that you can successfully “ping” **X5821**. The default local IP address is “192.168.1.1”.
- Step 3: Launch the Web browser (IE or Netscape), and enter the default IP address 192.168.1.1 into the address bar to access the Web management page.
- Step 4: Click on the **Management** link on the navigation bar and then on the **Update Software** link below it.
- Step 5: Click on the **Browse** to select the appropriate firmware and then click on the **Update Software** button. The upgrade process may take about 60 seconds. Do not reset the device while

Tools -- Update Software

Step 1: Obtain an updated software image file from your ISP.

Step 2: Enter the path to the image file location in the box below or click the "Browse" button to locate the image file.

Step 3: Click the "Update Software" button once to upload the new image file.

NOTE: The update process takes about 2 minutes to complete, and your DSL Router will reboot.

Software File Name:

Chapter 2

Web Management Interface

I. Overview

The Web Management Interface is provided to let the configuration of **X5821** as easily as possible. It provides a user-friendly graphical interface through a Web platform. You can configure bridge or router functions to accommodate your needs. In the section below, each configuration item is described in detail.

II. Preparation

- Step 1:** Please refer to the hardware installation procedure in Chapter 1 to install **X5821**.
- Step 2:** You should configure your PC to the same IP subnet as the **X5821**.
Example: **X5821:** 192.168.1.1
 Your PC: 192.168.1.2
- Step 3:** Connect your PC to **X5821** and make sure that the PING function is working properly. The default IP address of this device is 192.168.1.1
- Step 4:** Launch the Web browser (IE or Netscape), and enter the default IP address 192.168.1.1 into the address bar to access the Web management page.
- Step 5:** The **Login** dialog box will appear first.

1. Login

- ▶ The **Enter Network password** window will appear when starting the configuration. With the window active, type **admin** for both **User name** and **Password**, and then click on the **OK** button.

Note: The username and password are case-sensitive.

Please Log In to continue.

Log In

Username: admin

Password: *****

Log In

2. Quick Setup

This model supports Quick Setup for user to set up the modem/router to work with the provide service from ISP or TELCO.

STEP1> Click the “Quick Setup”, This Quick Setup will guide you through the steps necessary to configure your DSL Router.

STEP2> Select the check box “DSL Auto-connect” to enable DSL Auto-connect process. If you want to input VPI/VCI and choose the protocol to connect your service, just leave this check box disable, then input VPI, and VCI numbers. Click “Next” to go to next step.

STEP3> Choose the Connect Type, the specific page will show up, refer to chapter “WAN Setup” to go ahead next STEP for different configuration.

<Note> If the configuration is bridge encapsulation, there is no need to configure any more parameters. Only need to use the third party dial-up software to connect the Internet.

This model supports : PPPoA、PPPoE、MER、IPoA、Bridging. For detail configuration information, please check the following chapters configuration guide.

3. Device Info

Device Info is used to show the main information inside the router.

There are 5 pages below will be provided for the detailed data.

“Summary” will show

- a. Board ID
- b. Software Version
- c. Bootloader Version
- d. Line Rate
- e. LAN IP Address
- f. Default Gateway
- g. Primary DNS Server
- h. Secondary DNS Server

Device Info

Board ID:	96338L-2M-8M
Software Version:	3.06L.06V.A2pB022.d19d
Bootloader (CFE) Version:	1.0.37-0.7

This information reflects the current status of your DSL connection.

Line Rate - Upstream (Kbps):	
Line Rate - Downstream (Kbps):	
LAN IP Address:	192.168.5.234
Default Gateway:	
Primary DNS Server:	192.168.5.234
Secondary DNS Server:	192.168.5.234

“WAN Info” will show the related information about connection ID, ATM QoS setting if the VPI/VCI is configured already.

WAN Info										
VPI/VCI	Con. ID	Category	Service	Interface	Protocol	Igmp	QoS	State	Status	IP Address
0/35	1	UBR	br_0_35	nas_0_35	Bridge	N/A	Disabled	Enabled	ADSL Link Down	

“Statistics” will show the receive/transmit packets on LAN side and WAN side, ATM related interface statistics, ADSL physical layer related data. On the page, BER test on ADSL can be done by click the button “ADSL BER Test”

Statistics -- WAN												
Service	VPI/VCI	Protocol	Interface	Received				Transmitted				
				Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops	
br_0_35	0/35	Bridge	nas_0_35	0	0	0	0	204787	1674	0	1674	

Reset Statistics

Statistics -- LAN

Interface	Received				Transmitted			
	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops
Ethernet	693962	5856	0	0	1573984	4280	0	0

ATM Interface Statistics

In Octets	Out Octets	In Errors	In Unknown	In Hec Errors	In Invalid Vpi Vci Errors	In Port Not Enable Errors	In PTI Errors	In Idle Cells	In Circuit Type Errors	In OAM RM CRC Errors	In GFC Errors
0	0	0	0	0	0	0	0	0	0	0	0

AAL5 Interface Statistics

In Octets	Out Octets	In Ucast Pkts	Out Ucast Pkts	In Errors	Out Errors	In Discards	Out Discards
0	0	0	0	0	0	0	0

AAL5 VCC Statistics

VPI/VCI	CRC Errors	SAR Timeouts	Oversized SDUs	Short Packet Errors	Length Errors
0/35	0	0	0	0	0

Statistics -- ADSL

Mode:		
Type:		
Line Coding:		
Status:		Link Down
Link Power State:		L0
	Downstream	Upstream
SNR Margin (dB):		
Attenuation (dB):		
Output Power (dBm):		
Attainable Rate (Kbps):		
Rate (Kbps):		
Super Frames:		
Super Frame Errors:		
RS Words:		
RS Correctable Errors:		
RS Uncorrectable Errors:		
HEC Errors:		
OCD Errors:		
LCD Errors:		
Total Cells:		
Data Cells:		
Bit Errors:		
Total ES:		
Total SES:		
Total UAS:		

ADSL BER Test

Reset Statistics

“Route” will show the configured routing rules.

Device Info -- Route

Flags: U - up, ! - reject, G - gateway, H - host, R - reinstate
D - dynamic (redirect), M - modified (redirect).

Destination	Gateway	Subnet Mask	Flag	Metric	Service	Interface
192.168.5.0	0.0.0.0	255.255.255.0	U	0		br0

“ARP” will show the current ARP data.

Device Info -- ARP

IP address	Flags	HW Address	Device
192.168.5.193	Complete	00:0F:EA:8D:E2:0B	br0

4. Advanced Setup

To check “Advance Setup”, there are 4 sub-menus will show up. They are “WAN”, “LAN”, “Routing”, “DSL”. The different sections will introduce the setting for each page.

4.1 WAN

Click “WAN” on the left manual. Access “WAN” configuration page.

- Note: At most eight connections can be set. If you need to add a new connection, please delete or modify an existing connection.

Wide Area Network (WAN) Setup

Choose Add, Edit, or Remove to configure WAN interfaces.
Choose Save/Reboot to apply the changes and reboot the system.

VPI/VCI	Con. ID	Category	Service	Interface	Protocol	Igmp	QoS	State	Remove	Edit
0/35	1	UBR	pppoe_0_35_1	ppp_0_35_1	PPPoE	Disabled	Disabled	Enabled	☐	Edit

Add Remove Save/Reboot

Click on the next connection, which you want to modify. Press

“Edit” button, enter the configure guide, as the figure below.

ATM PVC Configuration

This screen allows you to configure an ATM PVC identifier (VPI and VCI) and select a service category. Otherwise choose an existing interface by selecting the checkbox to enable it.

VPI: [0-255]

VCI: [32-65535]

Service Category:

Enable Quality Of Service

Enabling packet level QoS for a PVC improves performance for selected classes of applications. QoS cannot be set for CBR and Realtime VBR. QoS consumes system resources; therefore the number of PVCs will be reduced. Use **Advanced Setup/Quality of Service** to assign priorities for the applications.

Enable Quality Of Service ☐

- The value of VPI/VCI should be provided by your ISP. After to input the PVC value, press “Next” into “connection type”.

Connection Type

Select the type of network protocol for IP over Ethernet as WAN interface

☐ PPP over ATM (PPPoA)

☒ PPP over Ethernet (PPPoE)

☐ MAC Encapsulation Routing (MER)

☐ IP over ATM (IPoA)

☐ Bridging

Encapsulation Mode

LLCSNAP-BRIDGING ▼

Back Next

The model supports five protocols. Choose the protocol which is provided by ISP and PVC encapsulation, click “Next” enter to the protocol configure. Below, the configuration of the five protocols is introduced.

- PPP over ATM (PPPoA)
- PPP over Ethernet (PPPoE)
- MAC Encapsulated Routing (MER)
- IP over ATM (IPoA)
- Bridging

- Some connection lines need to confirm the LLC or VC, if you can't confirm, please don't modify the default value or ask your ISP.

4.1.1 BRIDGE CONFIGURATION

Select the Bridging mode. Then press "Next" to specify the Service Name, and select the "Enable Bridge Service".



Unselect the check box below to disable this WAN service

Enable Bridge Service: ☒

Service Name:

Back Next

Press “Next” to “WAN configuration”, click “save” to save configuration, if you need to modify the parameter, click “back”.

WAN Setup - Summary
Make sure that the settings below match the settings provided by your ISP.

VPI / VCI:	0 / 35
Connection Type:	PPPoE
Service Name:	br_0_35
Service Category:	UBR
IP Address:	Automatically Assigned
Service State:	Enabled
NAT:	Enabled
Firewall:	Enabled
IGMP Multicast:	Disabled
Quality Of Service:	Disabled

Click "Save" to save these settings. Click "Back" to make any modifications.
NOTE: You need to reboot to activate this WAN interface and further configure services over this interface.

Note : When you use bridge mode, please close “DHCP SERVER”.

Local Area Network (LAN) Setup

Configure the DSL Router IP Address and Subnet Mask for LAN interface. Save button only saves the LAN configuration data. Save/Reboot button saves the LAN configuration data and reboots the router to make the new configuration effective.

IP Address:

Subnet Mask:

☐ Enable UPnP

☐ Enable IGMP Snooping

☒ Standard Mode

☐ Blocking Mode

☒ Disable DHCP Server

☐ Enable DHCP Server

Start IP Address:

End IP Address:

Leased Time (hour):

☐ Configure the second IP Address and Subnet Mask for LAN interface

Save

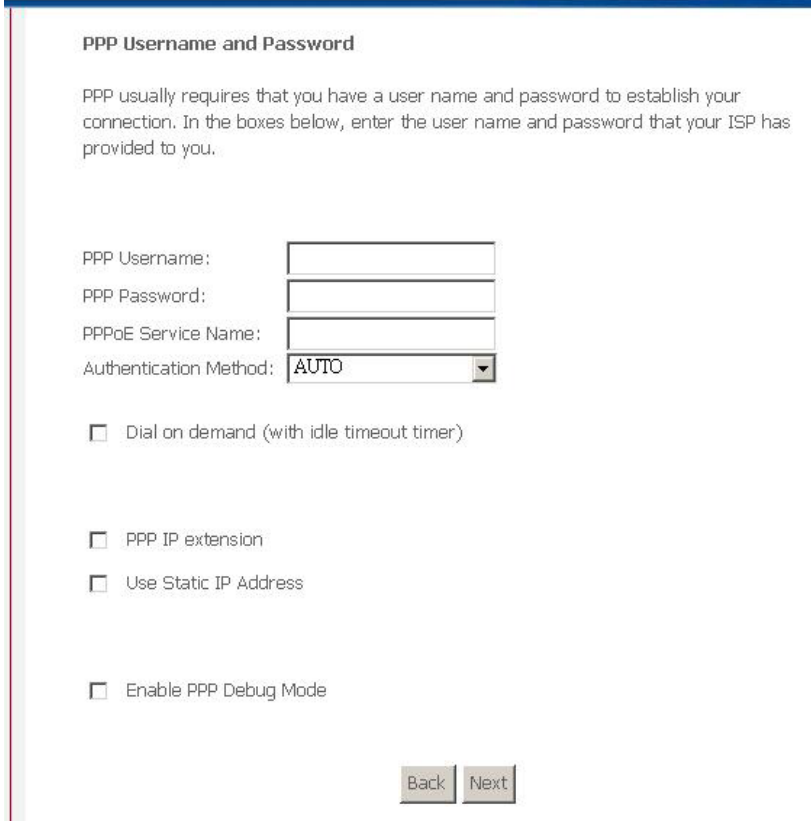
Save/Reboot

4.1.2 PPPoE CONFIGURATION

PPPoE is also known as RFC 2516. It is a method of encapsulating PPP packets over Ethernet.

PPPoA is also known as RFC2364 and named as Peer to Peer Protocol over ATM. As PPPoE, it also includes all the features of PPP. Although it's based on ATM protocol, the setting of all the other parameters is similar with PPPoE. So we only describe PPPoE in detail here.

Select PPP over Ethernet (PPPoE), press "Next step".



The screenshot shows a configuration window titled "PPP Username and Password". The window has a blue header bar. Below the title, there is a paragraph of text: "PPP usually requires that you have a user name and password to establish your connection. In the boxes below, enter the user name and password that your ISP has provided to you." Below this text are four input fields: "PPP Username:", "PPP Password:", "PPPoE Service Name:", and "Authentication Method:". The "Authentication Method:" field is a dropdown menu with "AUTO" selected. Below these fields are five checkboxes: "Dial on demand (with idle timeout timer)", "PPP IP extension", "Use Static IP Address", "Enable PPP Debug Mode", and "Enable PPP Debug Mode". At the bottom right of the window are two buttons: "Back" and "Next".

PPP Username and Password

PPP usually requires that you have a user name and password to establish your connection. In the boxes below, enter the user name and password that your ISP has provided to you.

PPP Username:

PPP Password:

PPPoE Service Name:

Authentication Method:

☐ Dial on demand (with idle timeout timer)

☐ PPP IP extension

☐ Use Static IP Address

☐ Enable PPP Debug Mode

☐ Enable PPP Debug Mode

- PPP Account: Your account from ISP to access Internet.
- Password: Input the password assigned by your ISP.
- PPPoE server name: Server name of network ISP. No need to set.
- Authentication Mode: Authentication mode of network ISP.
Default is AUTO.
- Connection on demand: When this mode is selected, the connection that has no traffic within assigned disconnect timeout (e.g. 1 minute) will be automatically disconnected. The connection will be activated again when traffic arrives. This function is advantageous for users who are charged with online time. It should be noticed that some programs automatically link to Internet. Computer will send data to network when infected by virus. Connection will not be disconnected under these data streams.
- Disconnect timeout: When "Connection on demand" is selected, this input box indicates that after how long the connection will be disconnected in the absence of traffic. If the value is 0, connection will not be disconnected.

Press "Next step" when configuration is finished. The following operation is same with Figure 3.5. Notice that PPPoE mode does not work until the modem is reset.

4.1.3 MAC Encapsulation Routing (MER)

Select MAC Encapsulation Routing (MER), press “Next”, and the configuration can be queried from your ISP.

WAN IP Settings

Enter information provided to you by your ISP to configure the WAN IP settings.
Notice: DHCP can be enabled for PVC in MER mode or IP over Ethernet as WAN interface if "Obtain an IP address automatically" is chosen. Changing the default gateway or the DNS effects the whole system. Configuring them with static values will disable the automatic assignment from DHCP or other WAN connection.
If you configure static default gateway over this PVC in MER mode, you must enter the IP address of the remote gateway in the "Use IP address". The "Use WAN interface" is optional.

☒ Obtain an IP address automatically
☐ Use the following IP address:
WAN IP Address:
WAN Subnet Mask:

☒ Obtain default gateway automatically
☐ Use the following default gateway:
☐ Use IP Address:
☐ Use WAN Interface:

☒ Obtain DNS server addresses automatically
☐ Use the following DNS server addresses:
Primary DNS server:
Secondary DNS server:

Enter information provided to you by your ISP to configure the WAN IP settings.

Notice: DHCP can be enabled for PVC in MER mode or IP over Ethernet as WAN interface if "Obtain an IP address automatically" is chosen. Changing the default gateway or the DNS, this will effect the whole system. Configuring them with static values will disable the automatic assignment from DHCP or other WAN connection.

If you configure static default gateway over this PVC in MER mode, you must enter the IP address of the remote gateway in the "Use IP address". The "Use WAN interface" is optional.

4.2 LAN

Click "LAN" below "Advanced Setup" on the left manual. Access "LAN" configuration page. The local port settings are used to

Local Area Network (LAN) Setup

Configure the DSL Router IP Address and Subnet Mask for LAN interface. Save button only saves the LAN configuration data. Save/Reboot button saves the LAN configuration data and reboots the router to make the new configuration effective.

IP Address:

Subnet Mask:

☐ Enable UPnP

☐ Enable IGMP Snooping

☒ Standard Mode

☐ Blocking Mode

☒ Disable DHCP Server

☐ Enable DHCP Server

Start IP Address:

End IP Address:

Leased Time (hour):

☐ Configure the second IP Address and Subnet Mask for LAN interface

configure the LAN IP address, DHCP server and relay settings.

- ▶ **IP Address:** Enter the IP address.
- ▶ **Netmask:** Enter the subnet mask for the IP address.
- ▶ **Enable IGMP Snooping:** To enable or disable IGMP Snooping by this setting. When the setting is enable, the model will snoop IGMP packets and set the related setting on switch to make sure the packets from video server will be multi-casted to the join port not all ports. This way will prevent the video streams generate packets storm.
- ▶ **Enable DHCP Server:** This setting to enable/disable DHCP server.
- ▶ **Start IP Address:** Enter the first IP for the address pool.
- ▶ **End IP Address:** Enter the last IP for the address pool.
- ▶ **Lease Time:** Enter the value in hours define how long an IP address can be assigned to a host.
- ▶ **Enable DHCP Relay:** This setting to enable/disable DHCP server.
- ▶ **Relay IP:** Enter the IP address of the DHCP relay server.

4.3 NAT

There are three pages to set NAT related functions include Virtual Servers, Port Triggering, DMZ Host. The following sections will describe page by page.

4.3.1 Virtual Servers

Access "Virtual Servers" to enter the page below. This page is to open related ports for specific applications. This page allows you to configure the port forwarding feature of this device. This feature works in conjunction with NAT/PAT and the firewall.

NAT -- Virtual Servers Setup

Virtual Server allows you to direct incoming traffic from WAN side (identified by Protocol and External port) to the Internal server with private IP address on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side. A maximum 32 entries can be configured.

Server Name	External Port Start	External Port End	Protocol	Internal Port Start	Internal Port End	Server IP Address	Remove
-------------	---------------------	-------------------	----------	---------------------	-------------------	-------------------	--------

Port forwarding can be used to provide local services for networks or node on the Internet in order to use special applications or play games.

Virtual Server allows you to direct incoming traffic from WAN side (identified by Protocol and External port) to the Internal server with private IP address on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side. A maximum 32 entries can be configured.

NAT -- Virtual Servers

Select the service name, and enter the server IP address and click "Save/Apply" to forward IP packets for this service to the specified server. NOTE: The "Internal Port End" cannot be changed. It is the same as "External Port End" normally and will be the same as the "Internal Port Start" or "External Port End" if either one is modified. Remaining number of entries that can be configured:32

Server Name:
☒ Select a Service:
☐ Custom Server:

Server IP Address:

External Port Start	External Port End	Protocol	Internal Port Start	Internal Port End
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		

4.3.2 Port Triggering

Some applications require that specific ports in the Router's firewall be opened for access by the remote parties. Port Trigger dynamically opens up the 'Open Ports' in the firewall when an application on the LAN initiates a TCP/UDP connection to a remote party using the 'Triggering Ports'. The Router allows the remote party from the WAN side to establish new connections back to the application on the LAN side using the 'Open Ports'. A maximum 32 entries can be configured.

NAT -- Port Triggering Setup

Some applications require that specific ports in the Router's firewall be opened for access by the remote parties. Port Trigger dynamically opens up the 'Open Ports' in the firewall when an application on the LAN initiates a TCP/UDP connection to a remote party using the 'Triggering Ports'. The Router allows the remote party from the WAN side to establish new connections back to the application on the LAN side using the 'Open Ports'. A maximum 32 entries can be configured.

AddRemove

Application		Trigger		Open		Remove
Name		Protocol	Port Range	Protocol	Port Range	
			StartEnd		StartEnd	

NAT -- Port Triggering

Some applications such as games, video conferencing, remote access applications and others require that specific ports in the Router's firewall be opened for access by the applications. You can configure the port settings from this screen by selecting an existing application or creating your own (Custom application) and click "Save/Apply" to add it.
Remaining number of entries that can be configured:32

Application Name:

☒ Select an application: Select One

☐ Custom application:

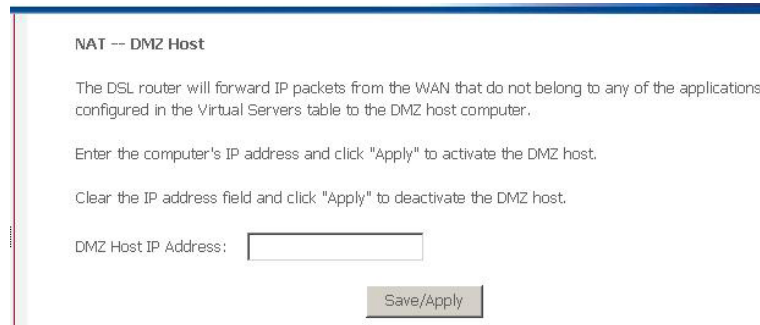
Save/Apply

Trigger Port Start	Trigger Port End	Trigger Protocol	Open Port Start	Open Port End	Open Protocol
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP

Save/Apply

4.3.3 DMZ Host

The DSL router will forward IP packets from the WAN that do not belong to any of the applications configured in the Virtual Servers table to the DMZ host computer. Enter the computer's IP address and click "Apply" to activate the DMZ host. Clear the IP address field and click "Apply" to deactivate the DMZ host.



NAT -- DMZ Host

The DSL router will forward IP packets from the WAN that do not belong to any of the applications configured in the Virtual Servers table to the DMZ host computer.

Enter the computer's IP address and click "Apply" to activate the DMZ host.

Clear the IP address field and click "Apply" to deactivate the DMZ host.

DMZ Host IP Address:

4.4 Security

Click "Security" below "Advanced Setup" on the left manual. There are two setting items, MAC Filtering or IP filtering and Parental Control.

4.5 Routing

Click "Routing" below "Advanced Setup" on the left manual. Access "Routing" configuration page. There are two sub-pages, "Default Gateway" and "Static Route".

4.5.1 Default Gateway

If Enable Automatic Assigned Default Gateway checkbox is selected, this router will accept the first received default gateway assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s). If the checkbox is not selected, enter the static default gateway AND/OR a WAN interface. Click 'Save/Apply' button to save it.

NOTE: If changing the Automatic Assigned Default Gateway from "unselected" to "selected", You must reboot the router to get the automatic assigned default gateway.

4.5.2 Static Route

- ▶ Click on the **Static Routes** link on the navigation bar to view the static routes table and configure this setting.
- ▶ Press "Add" to add the routing table for static routing.
- ▶ Enter the destination network address, subnet mask, gateway AND/OR available WAN interface then click "Save/Apply" to add the entry to the routing table.

Routing -- Static Route Add

Enter the destination network address, subnet mask, gateway AND/OR available WAN interface then click "Save/Apply" to add the entry to the routing table.

Destination Network Address:

Subnet Mask:

☐ Use Gateway IP Address

☒ Use Interface

4.6 DNS

4.6.1 DNS Server

If 'Enable Automatic Assigned DNS' checkbox is selected, this router will accept the first received DNS assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s) during the connection establishment. If the checkbox is not selected, enter the primary and optional secondary DNS server IP addresses. Click 'Save' button to save the new configuration. You must reboot the router to make the new configuration effective.

DNS Server Configuration

If 'Enable Automatic Assigned DNS' checkbox is selected, this router will accept the first received DNS assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s) during the connection establishment. If the checkbox is not selected, enter the primary and optional secondary DNS server IP addresses. Click 'Save' button to save the new configuration. You must reboot the router to make the new configuration effective.

☒ Enable Automatic Assigned DNS

Save

4.6.2 Dynamic DNS

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname in any of the many domains, allowing your DSL router to be more easily accessed from various locations on the Internet.

Dynamic DNS

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname in any of the many domains, allowing your DSL router to be more easily accessed from various locations on the Internet.

Choose Add or Remove to configure Dynamic DNS.

Hostname	Username	Service	Interface	Remove
Add Remove				

Choose Add or Remove to configure Dynamic DNS.

Add dynamic DDNS

This page allows you to add a Dynamic DNS address from DynDNS.org or TZO.

D-DNS provider

Hostname

Interface

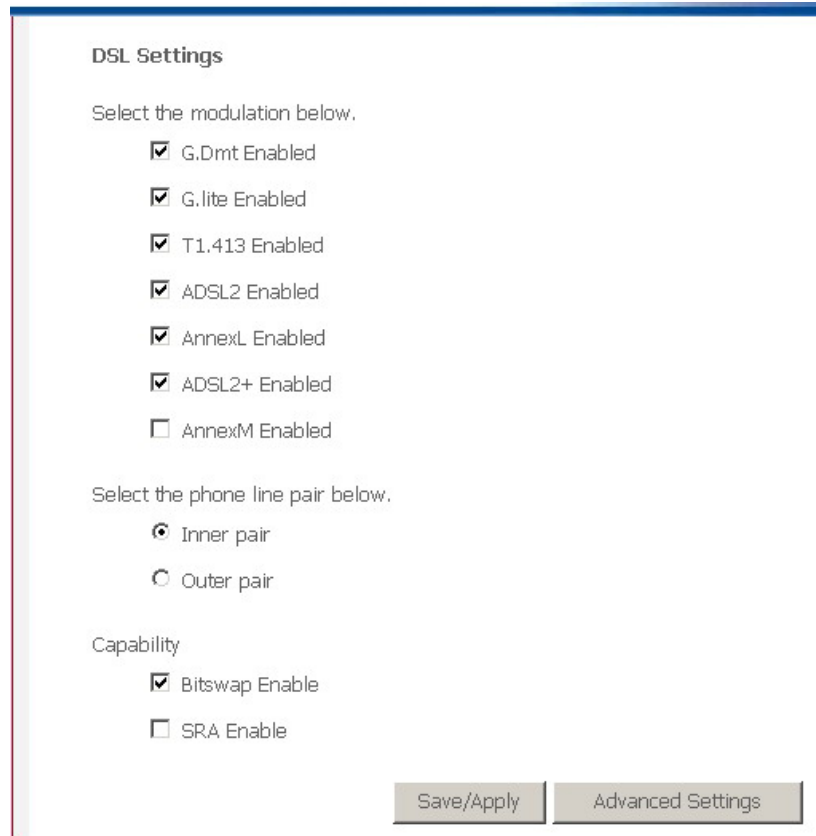
DynDNS Settings

Username

Password

4.7 DSL

Click “DSL” below “Advanced Setup” on GUI. There are DSL related settings on the page. The detailed, please check to your service provider.



The image shows a screenshot of the 'DSL Settings' page in a web-based GUI. The page has a blue header bar. Below the header, the title 'DSL Settings' is displayed. The first section is 'Select the modulation below.', which contains a list of seven modulation options, each with a checkbox: 'G.Dmt Enabled' (checked), 'G.lite Enabled' (checked), 'T1.413 Enabled' (checked), 'ADSL2 Enabled' (checked), 'AnnexL Enabled' (checked), 'ADSL2+ Enabled' (checked), and 'AnnexM Enabled' (unchecked). The second section is 'Select the phone line pair below.', which contains two radio button options: 'Inner pair' (selected) and 'Outer pair' (unselected). The third section is 'Capability', which contains two checkbox options: 'Bitswap Enable' (checked) and 'SRA Enable' (unchecked). At the bottom right of the settings area, there are two buttons: 'Save/Apply' and 'Advanced Settings'.

DSL Settings

Select the modulation below.

- ☒ G.Dmt Enabled
- ☒ G.lite Enabled
- ☒ T1.413 Enabled
- ☒ ADSL2 Enabled
- ☒ AnnexL Enabled
- ☒ ADSL2+ Enabled
- ☐ AnnexM Enabled

Select the phone line pair below.

- ☒ Inner pair
- ☐ Outer pair

Capability

- ☒ Bitswap Enable
- ☐ SRA Enable

Save/Apply Advanced Settings

5. Diagnostics

Your modem is capable of testing your DSL connection. The individual tests are listed as the table on web GUI. If a test displays a fail status, click "Rerun Diagnostic Tests" at the bottom of this page to make sure the fail status is consistent. If the test continues to fail, click "Help" and follow the troubleshooting procedures.

br_0_35 Diagnostics

Your modem is capable of testing your DSL connection. The individual tests are listed below. If a test displays a fail status, click "Rerun Diagnostic Tests" at the bottom of this page to make sure the fail status is consistent. If the test continues to fail, click "Help" and follow the troubleshooting procedures.

Test the connection to your local network

Test your ENET(1-4) Connection:	PASS	Help
---------------------------------	------	----------------------

Test the connection to your DSL service provider

Test ADSL Synchronization:	FAIL	Help
Test ATM OAM F5 segment ping:	FAIL	Help
Test ATM OAM F5 end-to-end ping:	FAIL	Help

Test

Test With OAM F4

6. Management

The model supports 5 management setting. They are

- 1) Settings Backup
- 2) System Log
- 3) Access Control
- 4) Update Software
- 5) Save/Reboot

The sections below will describe these setting page by page.

6.1 Settings

When you click Settings, another 3 items will show up, there are

- 1) Backup
- 2) Update
- 3) Restore Default

First one, the page "Backup" is used to backup DSL router configurations. You may save your router configurations to a file on your PC.

To access page "Update", this is use to update DSL router settings. You may update your router settings using your saved files.

To restore all setting to factory default, you can access page "Restore Default" to recovery all setting as factory initialised values.

6.2 System Log

To use System Log function, user must at first enable the feature by button "Configure Syslog". The page below will show up.

System Log

The System Log dialog allows you to view the System Log and configure the System Log options.

Click "View System Log" to view the System Log.

Click "Configure System Log" to configure the System Log options.

View System Log

Configure System Log

System Log -- Configuration

If the log mode is enabled, the system will begin to log all the selected events. For the Log Level, all events above or equal to the selected level will be logged. For the Display Level, all logged events above or equal to the selected level will be displayed. If the selected mode is 'Remote' or 'Both,' events will be sent to the specified IP address and UDP port of the remote syslog server. If the selected mode is 'Local' or 'Both,' events will be recorded in the local memory.

Select the desired values and click 'Save/Apply' to configure the system log options.

Log: ☐ Disable ☒ Enable

Log Level:

Display Level:

Mode:

Save/Apply

To check "Enable" to enable this function and choose Log Level, Display Level, Mode, then press "Save/Apply". To check "View System Log" to check the logged data on table.

6.3 Internet Time

To check "Automatically synchronize with Internet time servers", two NTP server setting will show up for user to choose one of servers in list or assign by self.

"Time zone offset" must be assigned your time zone for your router/modem to get your real local time.

6.4 Access Control

A Service Control List ("SCL") enables or disables services from being used.

Page "Service" is used to enable/disable the specified service such as FTP, HTTP, ICMP, TELNET and TFTP. User also can specify the service is from LAN to WAN or WAN to LAN.

Access Control -- Services

A Service Control List ("SCL") enables or disables services from being used.

Services	LAN
FTP	☐ Enable
HTTP	☒ Enable
ICMP	Enable
TELNET	☒ Enable
TFTP	☐ Enable

Save/Apply

Page "IP address" is used to specify the permission of the local IP address to access web GUI and re-edit the configuration for the managed router/modem. If to leave it blank, then every LAN address can access the device.

Page "Passwords", Access to your DSL router is controlled through three user accounts: admin, support, and user.

The user name "admin" has unrestricted access to change and view configuration of your DSL Router.

The user name "support" is used to allow an ISP technician to access your DSL Router for maintenance and to run diagnostics.

The user name "user" can access the DSL Router, view configuration settings and statistics, as well as, update the router's software.

Use the fields below to enter up to 16 characters and click "Apply" to

change or create passwords. Note: Password cannot contain a space.

Access Control -- Passwords

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The user name "user" can access the DSL Router, view configuration settings and statistics, as well as, update the router's software.

Use the fields below to enter up to 16 characters and click "Apply" to change or create passwords. Note: Password cannot contain a space.

Username:	
Old Password:	
New Password:	
Confirm Password:	

Save/Apply

6.5 Update Software

You may easily upgrade **X5821** embedded software by obtaining the compressed upgrade kit from the service provider and then following the steps for upgrading through a Web-browser:

- Step 1: Extract the ZIP file for updated firmware.
- Step 2: Connect **X5821** via the local Ethernet port or remote ADSL link, making sure that the **X5821** Ethernet IP address and your terminal are properly configured so that you can successfully "ping" **X5821**. The default local IP address is "192.168.1.1".
- Step 3: Launch the Web browser (IE or Netscape), and enter the default IP address 192.168.1.1 into the address bar to access the Web management page.
- Step 4: Click on the **Management** link on the navigation bar and then on the **Update Software** link below it.
- Step 5: Click on the **Browse** to select the appropriate firmware and then click on the **Update Software** button. The upgrade process may take about 60 seconds. Do not reset the device while

Tools -- Update Software

Step 1: Obtain an updated software image file from your ISP.

Step 2: Enter the path to the image file location in the box below or click the "Browse" button to locate the image file.

Step 3: Click the "Update Software" button once to upload the new image file.

NOTE: The update process takes about 2 minutes to complete, and your DSL Router will reboot.

Software File Name:

6.6 Save/Reboot

Click “Save/Reboot” button to store the setting before and reboot system to use the setting.

Appendix A – Technical Specifications

Hardware Specifications

■ LAN Interface

- One 10/100 Base-TX Ethernet port, IEEE 802.3/3u, RJ-45 connector

■ DSL Interface (ADSL line)

- One pair (2-wire) loop, 100 Ω line impedance with RJ-11 connector
- Complies with ITU-T G.992.1, G.992.2 and ANSI T1.413 Issue 2

■ Indicators

- **POWER** – A steady red light means the power connection works properly
- **LINK** – Yellow, shows DSL line status.
- **DATA** – Green, Flashing means the Modem is transmitting or receiving data
- **PC** – Green, Indicates status of connection to the PC network card

■ Power

- AC Adapter :Input 100 ~ 240 VAC, 50/60Hz ;
Output 5VDC/1A
- Power Consumption: std. 3Watts / max. 3.5 Watts

■ Environment

- Temperature:
 - 0 to 40 degrees C (Standard Operating)
 - -40 to 70 degree C (Non-operating)
- Humidity:
 - 10% to 90% (Non-condensing, Standard Operating)
 - 5% to 95% (Non-condensing, Non-operating)

■ Physical Dimensions

- (W × D × H) 128 mm × 110 mm × 30 mm

■ Certificates

- CE.

Software Specifications

■ ATM

- ATM cells over ADSL, AAL5
- Supports 8 PVCs under bridge mode and 5 PVCs under router mode
- Supports UBR, CBR, rt-VBR, nrt-VBR and GFR traffic classes
- ADSL-aware CAC (Connection Admission Control)
- Support for F5 AIS, RDI, and loopback cells
- Payload encapsulation
 - RFC2684 / RFC1483, Multiprotocol Encapsulation over ATM Adaptation

Layer 5

- RFC2225 / RFC1577, Classical IP and ARP over ATM (IPoA)
- RFC2364, PPP over AAL5 (PPPoA)

■ **ADSL standard**

- Support ANSI T1.413 Issue 2
- Support ITU G.992.1 Annex A (G.dmt)
- Support ITU G.992.2 Annex A (G.lite)
- Support ITU G.994.1 (G.hs)
- Maximum Rate: 8 Mbps for downstream and 1 Mbps for upstream

■ **ADSL2 standard**

- Support ITU G.992.3 Annex A (G.dmt.bis)
- Support ITU G.992.3 Annex L (Reach Extended ADSL2)
- Maximum Rate: 12 Mbps for downstream and 1.5 Mbps for upstream

■ **ADSL2+ standard**

- Support ITU G.992.5 Annex A
- Maximum Rate: 24 Mbps for downstream and 3 Mbps for upstream

■ **Networking Protocols**

- Support ATM Forum UNI 3.1 / 4.0 Permanent Virtual Circuits (PVCs)
- Support ATM Forum UNI 3.1 / 4.0 Permanent Virtual Circuits (PVCs)
- Support UBR Without PCR/UBR With PCB/CBR/nrt_VBR/rt_VBR
- Support RFC2684 LLC Encapsulation and VC Multiplexing over AAL5
- Support RFC2364 Point-to-Point Protocol (PPP) over AAL5
- Support RFC2225 Classical IP and ARP over ATM
- Support RFC2516 PPP over Ethernet: support Relay (Transparent Forwarding) and Client functions
- Support PPPoA or PPPoE Ip extension
- PPPoA/PPPoE support AUTO, PAP, CHAP authentication
- Support multiple PPPoE sessions on one PVC
- Support RFC1661 Point-to-Point Protocol
- Support AM F4/F5 End-to-End/Segment Loopback Cells
- Supports both ATM QoS, 8 tx queues in soft-SAR and supports packet level priority queuing in ATM driver.

■ **Bridging feature**

- Support self-learning bridge (IEEE 802.1D Transparent Bridging
- Support 4096 learning MAC addresses

■ **Routing feature**

- Support NAPT
- Support ALGs (Application Level Gateways): such as NetMeeting, MSN Messenger,
- FTP, QuickTime, mIRC, Real Player, CuSeeMe, VPN pass-through IPsec VPN etc.
- Support DMZ
- Support Port forwarding
- Support Port Triggering
- Support UPnP IGD (Internet Gateway Device) with NAT traversal capability
- Support static routing, RFC1058 RIPv1, RFC1723 RIPv2

- Support DNS Relay/Dynamic DNS
- Support DHCP Server/Relay/Client
- Support IGMP Proxy
- Support IGMPv1/v2 snooping in bridge mode
- Support IP/Bridge/802.1p QoS

■ **Security feature**

- Three level login including local admin, local user and remote technical support access
- Firewall support IP packets filtering based on IP address/Port number/Protocol type
- Support Three level login including local admin,local user and remote technical support access
- Support DOS (Denial of service) which detect & protect a number of attacks (such as SYN/FIN/RST Flood, Smurf, WinNuke, Echo Scan, Xmas Tree Scan etc.)

■ **Diagnostics**

- Responds and initiates ATM OAM F4/F5 end to end, segment to segment loopback tests
- ADSL BER Test based on idle cell bit error detection
- RDI response to receiving AIS
- PPPoE server discovery
- Ping DNS server and Default Gateway
- Statistics display for ADSL PHY, ATM, LAN (USB, Ethernet) and WAN interfaces
- Diagnostics for multiple PVCs and PPPoE sessions

■ **Management**

- User-friendly embedded web configuration interface with password protection
- Remote management access control
- Firmware upgrades through HTTP or TFTP
- SNMPv1/v2 agent with rfc2662 ADSL line MIB, rfc2515 ATM MIB, MIB-II
- Support diagnostic function (ADSL BER test /PPPOE server discovery etc.)
- Interface via serial port, telnet, or ssh
- Menu-driven CLI via serial port or telnet
- PSI configuration file upload and download
- Date/time update from SNTP Internet Time Server

Appendix B – Warranties

B1. Product Warranty

XAVi Technologies warrants that the ADSL unit will be free from defects in material and workmanship for a period of twelve (12) months from the date of shipment.

XAVi Technologies shall incur no liability under this warranty if

- The allegedly defective goods are not returned prepaid to XAVi Technologies within thirty (30) days of the discovery of the alleged defect and in accordance with XAVi Technologies' repair procedures; or
- XAVi Technologies' tests disclose that the alleged defect is not due to defects in material or workmanship.

XAVi Technologies' liability shall be limited to either repair or replacement of the defective goods, at XAVi Technologies' option.

XAVi Technologies MARKS NO EXPRESS OR IMPLIED WARRANTIES REGARDING THE QUALITY, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE BEYOND THOSE THAT APPEAR IN THE APPLICABLE USER'S DOCUMENTATION. XAVI SHALL NOT BE RESPONSIBLE FOR CONSEQUENTIAL, INCIDENTAL, OR PUNITIVE DAMAGE, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR DAMAGES TO BUSINESS OR BUSINESS RELATIONS. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES.

B2. Warranty Repair

1. During the first three (3) months of ownership, XAVi Technologies will repair or replace a defective product covered under warranty within twenty-four (24) hours of receipt of the product. During the fourth (4th) through twelfth (12th) months of ownership, XAVi Technologies will repair or replace a defective product covered under warranty within ten (10) days of receipt of the product. The warranty period for the replaced products shall be ninety (90) days or the remainder of the warranty period of the original unit, whichever is greater. XAVi Technologies will ship surface freight. Expedited freight is at customer's expense.
2. The customer must return the defective product to XAVi Technologies within fourteen (14) days after the request for replacement. If the defective product is not returned within this time period, XAVi Technologies will bill the customer for the product at list price.

B3. Out-of-Warranty Repair

XAVi Technologies will either repair or, at its option, replace a defective product not covered under warranty within ten (10) working days of its receipt. Repair charges are available from the Repair Facility upon request. The warranty on a serviced product is thirty (30) days measured from date of service. Out-of-warranty repair charges are based upon the prices in effect at the time of return.

Appendix C – Regulations

C1. FCC Part 15 Notice

Warning: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 to the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, used, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is unlikely to cause harmful interference. But if it does, the user will be required to correct the interference at his or her own expense. The authority to operate this equipment is conditioned by the requirement that no modifications will be made to the equipment unless XAVi expressly approves the changes or modifications.

C2. IC CS-03 Notice

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements as prescribed in appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee that the equipment will operate to the user's satisfaction.

Before installing this equipment, users should make sure that it is permissible to be connected to the facilities of the local telecommunications company. An acceptable method of connection must be used to install the equipment. The customer should be aware that compliance with the above conditions might not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Warning: Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority or an electrician.

C3. UL Safety Regulations

- ▶ Disconnect TNV circuit connector or before removing cover or equivalent.
- ▶ Disconnect TNV circuit connector(s) before disconnecting power.
- ▶ Do not use this product near water for example, near a bathtub, washbowl, and kitchen sink or laundry tub, in a wet basement, or near a swimming pool.
- ▶ Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightening.
- ▶ Do not use the telephone to report a gas leak in the vicinity of the leak.
- ▶ Use only the power cord batteries indicated in this manual. Do not dispose of batteries in a fire, as they may explode. Check with local codes for possible special disposal instructions.

No. 26 AWG Telephone Line Cord shall either be provided with the equipment or shall be described in the safety instruction. If fuse (F1) is not present, see the caution statement listed below:

CAUTION: To reduce the risk of fire, use only No. 26 AWG or larger UL Listed or CSA Certified Telecommunication Line Cord.

Contact Information

You can help us serve you better by sending us your comments and feedback. Listed below are the addresses, telephone and fax numbers of our offices. You can also visit us on the World Wide Web at www.xavi.com.tw for more information. We look forward to hearing from you!

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